

OGIP Calibration Memo CAL/SW/93-005

Summary of CALLIB routines

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SUMMARY

The document summarizes all available and currently planned modules of the CALLIB Subroutine Library.

This document is up-to-date for the FTOOLS version 3.2 Public release, and the NASA/GSFC development area as of 1995 Feb 01

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LOG OF SIGNIFICANT CHANGES

Release Date	Sections Changed	Brief Notes
1994 Feb 10	All	FTOOLS Version 2.8 Public Release
1994 Mar 30	All	FTOOLS Version 2.9 Public Release
1994 Jun 01	All	FTOOLS Version 3.0 Public Release
1994 Oct 21	All	FTOOLS Version 3.1 Internal Release
1995 Jan 10	All	Made compatible with <code>LaTeX2HTML</code> software
1995 Jan 13	All	FTOOLS Version 3.2 Public Release
2004 Apr 01	All	Made compatible with <code>tth</code>

ABOUT THIS DOCUMENT

This document was constructed from a single L^AT_EXavailable via anonymous ftp from the HEASARC (legacy.gsfc.nasa.gov) as:

`caldb/docs/memos/cal_sw_93_005.tex`

However, due to its size, two pdf versions are available:

- `cal_sw_93_005_small.pdf` consisting of Sections 1 – 3.
It is strongly recommended that casual users start with this document.
- `cal_sw_93_005.pdf`
consisting of the full memo. This document is **Large** since it contains the headers from all the CALLIB subroutines. It is anticipated that only a small minority of users will require this document.

(It should be noted that the Table of Contents of `cal_sw_93_005_small.pdf` includes the full Table of Contents of `cal_sw_93_005.pdf`).

Typically this document is up-dated once a month, but at least once per FTOOLS release. The last update and corresponding FTOOLS release are given on the front page.

1 INTRODUCTION

CALLIB is a subroutine library which contains useful utilities that have been used by several calibration related FTOOLS. The `/callib` library is a subdirectory of the FTOOLS package (see `Users.v3.0.ps`). The CALLIB library has three sub-directories, `src/gen` which contains system independant routines, `src/unx` which contains UNIX/ULTRIX specific code and `src/vms` which contains the VMS specific routines.

One of the primary features of the CALLIB library is that it contains OGIP standard format FITS readers and writers, for example `wtpha1.f` (see section 2.1.8) writes a FITS PHA extension that conforms to the OGIP standard format, that software expects.

1.1 Using CALLIB routines

For a complete guide to installing FTOOLS see the Ftools installation guide (`Install.v3.0.ps`). In addition the Developer's Guide to FTOOLS is a useful reference (`Develop.v3.0.ps`). FTOOLS developers should note that the CALLIB library is not available with the CORE FTOOLS distribution, therefore it should not be used for a core package task. Currently the core packages are FUTILS, FIMAGE, and TIME. Assuming FTOOLS is installed, any user can access the CALLIB or any other FTOOLS library using the following path,

for UNIX/ULTRIX :

```
LIBF = -L/path/host -lcaltools -lftools -lhost -lxanlib -lfitsio
```

where *path* should contain your path to the FTOOLS host directory. For HEASARC users this is `ftools/SUN/release` for Suns, SUN should be replaced by DEC for DECstations.

for VMS :

```
ftools:[host]caltools/lib,ftools:[host]ftools/lib
```

The caltools link enables users to access the CALLIB library.

2 SUMMARY TABLES

Table 1: Available General Routines for writing Datasets

Subroutine Name	Primary Author	Versions	Description	
		Pub	Dev	Writes ...
wt_ear1992a	IMG	0.9.0	0.9.0	a EARVERSN=1992a extension
wt_eef1992a	IMG	1.0.2	1.0.2	a EEFVERSN = 1992a extension
wt_ftl1992a	IMG	1.0.0	1.0.0	a FLTVERSN = 1992a extension
wt_spec	RY	1.0.8	1.0.8	a PHAVERSN = 1992a extension
wtarf1	IMG	1.0.1	1.0.1	an ARFVERSN = 1992a dataset
wtebd1	IMG	2.0.1	2.0.1	an EBOUNDS ext of an RMFVERSN = 1992a dataset
wtexm1	RY	1.0.1	1.0.1	a Exposure map in the Primary array
wtpha1	IMG	3.0.3	3.0.3	a PHAVERSN = 1992a extension
wtrmf1	IMG	3.2.0	3.2.0	a RMFVERSN = 1992a extension
wtrpf1	RY	1.0.1	1.0.1	a RPSFVERS = 1992a dataset

Table 2: Planned General Routines for writing Datasets

Subroutine Name	Author	Priority	Status	Description
Writes ...				
wtcol1.f	IMG	1	99%	a COLVERSN = 1992a dataset
wtear1	IMG	1	99%	a EARVERSN = 1992a dataset
wteef1	IMG	1	95%	a EEFVERSN = 1992a dataset
wteff1.f	IMG	1	99%	a EFFVERSN = 1992a dataset
wtegd1.f	IMG	1	99%	a EGRDVERS = 1992a dataset
wtobf1	IMG	1	99%	a OBSVERSN = 1992a dataset
wtspr1.f	IMG	1	99%	a SPRVERSN = 1992a dataset
wttrs1.f	IMG	1	99%	a TRANSVER = 1992a dataset
wtvig1.f	IMG	1	99%	a VIGVERSN = 1992a dataset

Table 3: Available General Routines for accessing Datasets

Subroutine Name	Primary Author	Versions		Description
		Pub	Dev	Reads ...
rdarf1	IMG	1.0.0	1.0.0	an ARFVERSN = 1992a dataset
rdatrd	RY	1.0.0	1.0.0	a RDF Attitude dataset
rdebd1	RY	1.1.2	1.1.2	an EBOUNDS ext of an RMFVERSN = 1992a dataset
rdetm1	RY	1.0.0	1.0.0	a detector map from a FITS Primary Array
rdgti1	RY	2.0.0	2.0.0	a GTI dataset
rdmvrd	RY	1.0.0	1.0.0	a RDF Event Rate dataset
rdoht1	RY	1.1.0	1.1.0	a SPECTRUM DETECTOR dataset
rdpha1	RY	1.0.3	1.0.3	a PHAVERSN = 1992a dataset
rdrmf1	RY	1.1.1	1.1.1	a RMFVERSN = 1992a dataset
rdrpf1	RY	1.1.1	1.1.1	a RPSFVERS = 1992a dataset

Table 4: Planned General Routines for accessing Datasets

Subroutine Name	Author	Priority	Status	Description
Reads ...				
rdeprd	RY	1	75%	a RDF EPHEM dataset
rdhkrd	RY	1	75%	a RDF HKP dataset
rdstrd	RY	1	75%	a RDF HKSTA dataset

Table 5: Available General Routines for writing Keywords

Subroutine Name	Primary Author	Versions		Description
		Pub	Dev	Writes ...
wt_addcom	IMG	1.0.0	1.0.0	COMMENTS to CDU from ASCII i/p file
wt_cifikys	IMG	1.1.0	1.1.0	keywords mandatory for CIF purposes
wt_objradec	IMG	1.0.1	1.0.1	RA & dec keywords for an object/target
wt_obsinfo	IMG	1.1.1	1.1.1	keywords containing observational details
wt_pntradec	IMG	1.0.1	1.0.1	RA, dec & roll keywords for pointing direction
wt_regdesc	IMG	1.3.0	1.3.0	keywords describing region descriptors
wt_scradec	IMG	1.0.1	1.0.1	RA, dec & roll keywords for spacecraft orientation
wtftim	IMG	1.0.2	1.0.2	keywords describing (observing) time (in detail)
wttobs	IMG	1.0.1	1.0.1	keywords describing (observing) time (crudely)

Table 6: Planned General Routines for writing Keywords

Subroutine Name	Author	Priority	Status	Description

Table 7: Available General Routines for accessing Keywords

Subroutine Name	Author	Latest Version	Description
rd_cifikys	IMG	1993 Feb 17	Reads Mandatory keywords from current header unit
rd_obsinfo	IMG	1.0.0	Reads Observation details of CHDU
rdtobs	IMG	1.0.0	Reads details of time of observation from CHDU

Table 8: Planned General Routines for accessing Keywords

Subroutine Name	Author	Priority	Status	Description

Table 9: Other General FITS/caldb-related CALLIB Routines Available

Subroutine Name	Primary Author	Versions		Description
		Pub	Dev	
cfappend	RY			spawns FTOOL fappend
cgetlun	IMG	sys-dep	sys-dep	Gets a free logical unit
ck_file	RY	1.0.3	1.0.3	Checks for illegal (output) filenames <i>etc</i>
ck_man	RY	1.0.1	1.0.1	Checks whether record is mandatory keyword
copyphd	RY	1.0.2	1.0.2	Copies the primary header from one file to another
do_addcom	IMG	1.0.1	1.0.1	Opens FITS file & adds COMMENTS from ASCII file
fnfext	IMG	1.1.0	1.1.0	Finds extension(s) with given EXTNAME
fnfhdru	IMG	1.1.0	1.1.0	Finds extension(s) with given HDUCLASn values
getkeys	RY	1.0.0	1.0.0	Returns list of keywords
gt_csysnms	IMG	1.1.0	1.1.0	Returns standard colnames for given spatial coord sys
mver	RY	1.0.0	1.0.0	moves to desired extension
mvext	RY	1.1.0	1.1.0	opens file and moves to desired extension
mvfile	RZ	1.0	1.0	renames a given file
op_npa	IMG	1.0.3	1.0.3	Gets free unit & opens a null P.array FITS file
par_dim	RY	1.0.0	1.0.0	Parse TDIMnnn keyword
pg_fecho	RY	1.0.0	1.0.0	pages screen output
wt_com	RY	1.0.3	1.0.3	Copy i/p file to o/p file excl PHA extension
wt_copy	RY	1.0.1	1.0.1	Copy i/p extn to o/p file excl PHA extension
wt_ferrmsg	RY	1.0	1.0	writes FITSIO error message in standard format

Table 10: Other General CALLIB Routines Available related to string manipulation

Subroutine Name	Primary Author	Versions		Description
		Pub	Dev	
apndfl	RZ	1.0	1.0	Concatinates path & filename
cconc	RZ	(no #)	(no #)	Converts string to system default
clenact	RY	??	??	Returns length of string (excluding trailing blanks)
clnstr	IMG	1.0.0	1.0.0	Replaces "illegal" ASCII characters within a string
clcase	RY	1.0	1.0	Converts to lower case
cptend	RZ	1.0	1.0	Concats logical,director & filename
crmblk	IMG	1.0.0	1.0.0	Removes all blanks from a string
crmvblk	RZ ??	??	??	Removes LEADING blanks from a string
crmvxbk	??	??	??	Removes extra blanks from strings
rmvexp	RY	1.0.0	1.0.0	Replaces multiple blanks with single blank

Table 11: Other General CALLIB Routines Available

Subroutine Name	Primary Author	Versions		Description
		Pub	Dev	
cbftoch	IMG	(no #)	(no #)	Converts a (SF) byte buffer to char string
ccaldj	RZ	(no #)	(no #)	Converts Gregorian Calendar to MJD
ccldj	RZ	(no #)	(no #)	Converts Gregorian Calendar to MJD
cmp_fact	RY	1.0.2	1.0.2	Determines compression factor for rebinning
cnxpksf	IMG	1.0.1	1.0.1	Gets and decodes SF package header
copnrstf	IMG	1.0.4	1.0.4	Opens an SF format file for reading
crstrsf	IMG	1.0.0	1.0.0	Write strings as aux records to SF file
crsubsf	IMG	1.0.2	1.0.2	Reads subsidiary SF record
cspawn	IMG	1.1.0	1.1.0	Spawns to operating system
ctrlog	RZ	1.0	1.0	Translates logical name
delfil	RZ	1.0	1.0	Deletes a file
grp_rmf	IMG	1.1.2	1.1.2	Calculates channel subsets for an RSP_MATRIX dataset
gtdate	RZ	1.0	1.0	Returns system date as integer day, month, year
gtdir	RZ	1.0	1.0	Gets current working directory
gttime	RZ	1.0	1.0	Returns system time as integer hr,min,sec
ppthmm	RZ	1.0	1.0	Parse string into disk,directory,filename strings
rd_rsp	IMG	1.1.4	1.1.4	Reads an SF-style RSP file
remap	IMG	—	1.0.0	Remaps 1-d array onto another grid

Table 12: Planned General CALLIB Routines (Other)

Subroutine Name	Author	Priority	Status	Description
gt_instalias	RY	1	0%	Returns any aliases for INSTRUME keyword value
gt_telealias	RY	1	0%	Returns any aliases for TELESCOPE keyword value
parse_cdb	RY	1	0%	Parses a CBD expression

Table 13: Available Einstein-specific CALLIB Routines

Subroutine Name	Primary Author	Versions Pub	Versions Dev	Description
wtehr1	IMG	–	1.1.0	writes DETECTOR extension for the HRI
wtipc1	IMG	–	1.2.0	writes DETECTOR extension for the IPC

Table 14: Available EXOSAT-specific CALLIB Routines

Subroutine Name	Primary Author	Versions		Description
		Pub	Dev	
cma_detnam	IMG	–	1.0.0	returns DETNAM & FILTER strings for the CMA
cshfdmy	IMG	–	?	converts SHF key to calendar dd/mm/yy
cshftime	IMG	–	?	converts SHF key to integer yr,day,hr,min,sec
me_detnam	IMG	–	1.0.0	returns DETNAM string for the ME
wtxgs1	IMG	–	1.0.0	writes DETECTOR extension for the GSPC
wtxme1	IMG	–	2.0.0	writes DETECTOR extension for the ME

Table 15: Available ROSAT-specific CALLIB Routines

Subroutine Name	Primary Author	Versions Pub	Versions Dev	Description
livtim	???	???	???	calc PSPC livetime ????
rdatu0	RY	–	1.0.1	reads US REV0 format Attitude extension
rdmvu0	RY	–	1.0.0	reads US REV0 format (Qualified) EVRAT extension
wtrhr1	IMG	–	1.1.0	writes DETECTOR extension for the HRI
wtrps1	IMG	–	2.1.0	writes DETECTOR extension for the PSPC

3 REFERENCES

Develop.v3.0.ps, Blackburn, J.K,

available via anonymous FTP, /FTP/software/ftools/release/Develop.v3.0.ps

Install.v3.0.ps, Blackburn, J.K, Greene, E.A,

available via anonymous FTP, /FTP/software/ftools/release/Install.v3.0.ps

Users.v3.0.ps, Blackburn, J.K, Greene, E.A,

available via anonymous FTP, /FTP/software/ftools/release/Users.v3.0.ps